CLAIMS

1. A cell in which a genomic gene encoding an enzyme relating to a sugar chain modification in which 1-position of fucose is bound to 6-position of N-acetylglucosamine in the reducing end through α-bond in a complex type N-glycoside-linked sugar chain is knocked out, wherein the cell is naturalized in a serum-free medium.

2. The cell according to claim 1, wherein all of alleles on a genome encoding an enzyme relating to modification of a sugar chain in which 1-position of fucose is bound to 6-position of N-acetylglucosamine in the reducing end through α-bond in a complex type N-glycoside-linked sugar chain are knocked out, and wherein the cell is naturalized in a serum-free medium.

3. The cell according to claim 1 or 2, wherein an exon region containing an initiation codon of the genomic gene encoding an enzyme relating to modification of a sugar chain in which 1-position of fucose is bound to 6-position of N-acetylglucosamine in the reducing end through α-bond in a complex type N-glycoside-linked sugar chain is deleted, and wherein the cell is naturalized in a serum-free medium.

4. The cell according to any one of claims 1 to 3, wherein the enzyme relating to modification of a sugar chain in which 1-position of fucose is bound to 6-position of N-acetylglucosamine in the reducing end through α-bond in a complex type N-glycoside-linked sugar chain is α-1,6-fucosyltransferase.

5. The cell according to claim 4, wherein the α-1,6-fucosyltransferase is a protein encoded by a DNA selected from the following (a) or (b):

(a) a DNA comprising the nucleotide sequence represented by SEQ ID NO:1;

(b) a DNA which hybridizes with a DNA consisting of the nucleotide sequence represented by SEQ ID NO:1 under stringent conditions and encodes a protein having α-1,6-fucosyltransferase activity.

6. The cell according to claim 4, wherein the α-1,6-fucosyltransferase is a protein selected from the group consisting of the following (a), (b) and (c):

(a) a protein comprising the amino acid sequence represented by SEQ ID NO:5;

(b) a protein consisting of an amino acid sequence in which one or more amino acid(s) is/are deleted, substituted, inserted and/or added in the amino acid sequence represented by SEQ ID NO:5 and having α-1,6-fucosyltransferase activity;
(c) a protein consisting of an amino acid sequence which has at least 80% amino acid sequence homology to the amino acid sequence represented by SEQ ID NO:5 and having α-1,6-fucosyltransferase activity.

7. The cell according to any one of claims 1 to 6, which is resistant to a lectin which recognizes a sugar chain structure in which 1-position of fucose is bound to 6-position of N-acetylglucosamine in the reducing end through α-bond in a complex type N-glycoside-linked sugar chain.

8. The cell according to claim 7, wherein said resistance is resistance in which the cell survives at a higher ratio than a cell in which the genomic gene has not been knocked out when the cells are cultured in a medium containing the lectin which recognizes a sugar chain structure in which 1-position of fucose is bound to 6-position of N-acetylglucosamine in the reducing end through α-bond in a complex type N-glycoside-linked sugar chain.

9. The cell according to any one of claims 1 to 7, wherein the serum-free medium is a protein-free medium.

10. The cell according to any one of claims 1 to 9, which comprises a gene encoding a glycoprotein.

11. The cell according to claim 10, wherein the glycoprotein is a glycoprotein having no sugar chain structure in which 1-position of fucose is bound to 6-position of N-acetylglucosamine in the reducing end through α-bond in a complex type N-glycoside-linked sugar chain.

12. The cell according to claim 10 or 11, wherein the glycoprotein is an antibody.

13. The cell according to claim 12, wherein the antibody belongs to an IgG class.

14. A process for producing a glycoprotein composition, which comprises using the cell according to any one of claims 1 to 13.

15. A process for producing a glycoprotein composition, which comprises culturing the cell according to any one of claims 1 to 13 in a medium to form and accumulate the glycoprotein composition in the culture, and recovering and purifying the glycoprotein composition from the culture.

16. The process for producing a glycoprotein composition according to claim 14 or 15, wherein the process is carried out by batch culture, fed-batch culture or perfusion culture.

17. The process according to any one of claims 14 to 16, wherein at least one selected from a nutrient factor and a physiologically active substance is added to the medium during culturing.

18. The process according to claim 17, wherein the nutrient factor is at least one selected from a glucose, an amino acid and a vitamin.

19. The process according to claim 17, wherein the physiologically active substance is at least one selected from an insulin, an insulin-like growth factor, transferrin and albumin.

20. The process according to any one of claims 14 to 19, wherein the glycoprotein composition is an antibody composition.

21. A method for naturalizing a cell in which a genomic gene encoding an enzyme relating to a sugar chain modification in which 1-position of fucose is bound to 6-position of N-acetylglucosamine in the reducing end through α-bond in a complex type N-glycoside-linked sugar chain is knocked out in a serum-free medium, which comprises inoculating the cell into a medium for naturalization to give a cell density of 1×10^5 to 1×10^6 cells/ml.

22. A method for obtaining a clone in which a genomic gene encoding an enzyme relating to a sugar chain modification in which 1-position of fucose is bound to 6-position of N-acetylglucosamine in the reducing end through α-bond in a complex

type N-glycoside-linked sugar chain is knocked out, which comprises naturalizing the cell in a serum-free medium by the method according to claim 21, and then cloning the cell.

23. A cell in which a genomic gene encoding an enzyme relating to a sugar chain modification in which 1-position of fucose is bound to 6-position of N-acetylglucosamine in the reducing end through α-bond in a complex type N-glycoside-linked sugar chain is knocked out, wherein the cell is naturalized in a serum-free medium, which is obtainable by the method according to claim 21.

24. A clone in which a genomic gene encoding an enzyme relating to a sugar chain modification in which 1-position of fucose is bound to 6-position of N-acetylglucosamine in the reducing end through α-bond in a complex type N-glycoside-linked sugar chain is knocked out, wherein the clone is naturalized in a serum-free medium, which is obtainable by the method according to claim 22.

25. The method according to claim 21 or 22, wherein the serum-free medium is a protein-free medium,

26. The cell according to claim 23, wherein the serum-free medium is a protein-free medium.

27. The clone according to claim 24, wherein the serum-free medium is a protein-free medium.